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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/894,073	06/28/2001	Julie Ann Watts	SVL9-2001-0002US1/2021P	6518

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EXAMINER

GODDARD, BRIAN D

ART UNIT	PAPER NUMBER
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2171

DATE MAILED: 07/26/2004

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/894,073

Applicant(s)

WATTS, JULIE ANN

Examiner

Brian Goddard

Art Unit

2171

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 June 2004.
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-18 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 28 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This communication is responsive to the Request for Continued Examination filed 7 June 2004, entering Amendment B (filed 3 May 2004).
2. Claims 1-18 are pending in this application. Claims 1, 8, 9 and 16-18 are independent claims. In Amendment B, no claims were added or canceled, and claims 1, 8-9 and 16-18 were amended. This action is non-final.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the article entitled, "ARIES: A Transaction Recovery Method Supporting Fine-Granularity Locking and Partial Rollbacks Using Write-Ahead Logging" by Mohan et al. (hereinafter "Mohan") in view of U.S. Patent No. 5,983,225 to Anfindsen.

Referring to claim 1, Mohan discloses a method for selectively releasing locks on data as claimed. See sections 1.2-1.3, 2 and 5 for the details of this disclosure. Mohan teaches a method for selectively releasing locks on data, comprising the steps of:

(a) providing at least one savepoint [SaveLSN (See section 5.2)] in a transaction, wherein a first lock [write/update lock] and a second lock [read lock] are acquired after the at least one savepoint [See first full paragraph on page 120], wherein the first lock is assigned to the at least one savepoint;

(b) rolling back the transaction [See Fig. 8] to the at least one savepoint; and
(c) releasing any locks [See first full paragraph on page 120] assigned to the at least one savepoint, wherein the first lock is released.

Mohan does not explicitly teach the second lock being "assigned to the transaction" and being maintained (as with any locks assigned to the transaction) after rolling back the transaction to the at least one savepoint as claimed. This however, is only because Mohan is silent on differentiation between locking/unlocking procedures during rollback being that the paper deals only with recovery after a system failure.

Anfindsen teaches a system and method similar to that of Mohan, including repeatable read and transaction consistency isolation wherein all read locks acquired by a transaction are assigned to the transaction and maintained until commit or abort, even if the transaction rolls back to a savepoint prior to the point of acquiring the read lock. See column 9, lines 25-67 of Anfindsen's specification for this disclosure. Anfindsen discloses the purpose of this practice to ensure that read data will not change until the transaction terminates (i.e., a read that is repeated will return the original row, unchanged).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Anfindsen's repeatable read and transaction consistency isolation procedures to the system and method of Mohan by assigning any read lock(s) ["second lock" in claim language] acquired after any given savepoint to the transaction and maintaining these locks until commit or abort. One would have been motivated to do so in order to expand Mohan's system to deal with partial rollbacks caused by the

transaction itself instead of just for failure recovery, guaranteeing that read data would not change until the transaction terminated, as provided by Anfindsen. One would have been further motivated to combine these references because of Mohan's disclosure of the importance of repeatable read in transaction recovery (See pages 144-145) and Anfindsen's disclosure of the importance of partial rollback to a savepoint (See columns 2 and 14).

Referring to claim 2, the system and method of Mohan in view of Anfindsen as applied to claim 1 above discloses the invention as claimed. See the portions of the references cited above for the details of this disclosure. Mohan v. Anfindsen teaches the method of claim 1, as above, wherein the providing step (a) comprises: (a1) providing a sequence of savepoints [Mohan: See section 5.2] in the transaction, wherein the first lock [write/update lock] is assigned to one of the sequence of savepoints [the savepoint immediately preceding it (Mohan: See section 5.2)] and the second lock [read lock] is assigned to the transaction [See above] as claimed.

Referring to claim 3, the system and method of Mohan in view of Anfindsen as applied to claim 1 above discloses the invention as claimed. See the portions of the references cited above for the details of this disclosure. Mohan v. Anfindsen teaches the method of claim 1, as above, wherein the rolling step (b) comprises: (b1) rolling back the transaction to one of a sequence of savepoints [Mohan: See section 5.2, particularly the first full paragraph on page 120] as claimed.

Referring to claim 4, the system and method of Mohan in view of Anfindsen as applied to claim 1 above discloses the invention as claimed. See the portions of the

references cited above for the details of this disclosure. Mohan v. Anfindsen teaches the method of claim 1, as above, wherein the releasing step (c) comprises:

(c1) releasing the first lock assigned to one of a sequence of savepoints to which the transaction is rolled back [Mohan: See section 5.2, particularly the first full paragraph on page 120]; and

(c2) releasing any locks assigned to subsequent savepoints [Mohan: See same section], wherein the second lock assigned to the transaction [See discussion of claim 1 above] and any locks assigned to preceding savepoints [Mohan: See same section] are maintained.

Referring to claim 5, the system and method of Mohan in view of Anfindsen as applied to claim 4 above discloses the invention as claimed. See the portions of the references cited above for the details of this disclosure. Mohan v. Anfindsen teaches the method of claim 4, as above, further comprising: (c3) releasing another of the sequence of savepoints [Mohan: a prior savepoint (SaveLSN) during a second/nested rollback OR a subsequent savepoint (SaveLSN) from the one to which the transaction was rolled back] as claimed.

Referring to claim 6, the system and method of Mohan in view of Anfindsen as applied to claim 5 above discloses the invention as claimed. See the portions of the references cited above for the details of this disclosure. Mohan v. Anfindsen teaches the method of claim 5, as above, further comprising: (c4) reassigning at least one lock [Mohan: See section 5.2] assigned to the another of the sequence of savepoints [accomplished by the PrevLSN & UndoNxtLSN fields (pointer(s) to the most recent

savepoint after rollback) in undone (CLR'd) log records] to a preceding savepoint [the most recent savepoint after rollback (i.e. the savepoint (SaveLSN) to which the transaction was rolled back)] as claimed.

Referring to claim 7, the system and method of Mohan in view of Anfindsen as applied to claim 5 above discloses the invention as claimed. See the portions of the references cited above for the details of this disclosure. Mohan v. Anfindsen teaches the method of claim 5, as above, further comprising: (c4) maintaining knowledge of the released another of the sequence of savepoints [in the transaction log (Mohan: See sections 3 & 5.2)], such that if the transaction is rolled back to a preceding savepoint, the at least one lock assigned to the released another of the sequence of savepoints is released [See discussion of claims 5 & 6 above] as claimed.

Claim 8 is rejected on the same basis as claims 1-4. See the discussions regarding claims 1-4 above for the details of this disclosure.

Claims 9-15 are rejected on the same basis as claims 1-7 respectively. See the discussions regarding claims 1-7 above for the details of this disclosure. In particular, Mohan's (as modified by Anfindsen) method described with regard to claims 1-7 above is implemented on a computer readable medium as claimed. See section 13.1 of Mohan's article for the details of this disclosure.

Claim 16 is rejected on the same basis as claim 8. See the discussions regarding claims 8-15 above for the details of this disclosure.

Claim 17 is rejected on the same basis as claim 1. See the discussion regarding claim 1 above for the details of this disclosure. See also section 13.1 of Mohan's article for the disclosure of the "system".

Claim 18 is rejected on the same basis as claim 17. See the discussions regarding claims 1 and 17 above, as well as the relevant portions of the references cited therein, for the details of this disclosure.

Response to Arguments

4. Applicant's arguments filed 3 May 2004 have been fully considered but they are not persuasive.

Referring to applicant's remarks on pages 9-10 regarding the Section 103 rejection of the independent claims: Applicant argued that unlike the present invention, the combination of Mohan and Anfindsen does not disclose selectively assigning locks either to the savepoint or the transaction, and then using these assignments to determine which locks to release after a rollback.

The examiner disagrees for the following reasons: As stated by applicant, Mohan discloses "locks obtained after the establishment of the savepoint which is the target of the rollback may be released after the partial or total rollback is completed." (p. 120, first full paragraph) However, Anfindsen discloses acquiring read locks to the transaction (not all locks as implied by applicant) and maintaining these locks until commit or abort, wherein other locks (such as for write, update & delete operations) are released upon rollback. Thus, Anfindsen does disclose the selective assignment of

locks using the repeatable read and transaction consistency isolation protocols, contrary to applicant's assertion. As this technology from Anfindsen is added to Mohan's disclosure in the combination, read locks are selectively assigned to the transaction while other locks are assigned to the savepoint(s), and these assignments determine which locks are released after a rollback. Finally, Mohan in view of Anfindsen does teach rolling back the transaction to the at least one savepoint and releasing any locks assigned to the at least one savepoint, wherein any locks assigned to the transaction are maintained...in combination with the other elements in the independent claims.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Goddard whose telephone number is 703-305-7821. The examiner can normally be reached on M-F, 9 AM - 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Safet Metjahic can be reached on 703-308-1436. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

bdg
23 July 2004


FRANTZ COBY
PRIMARY EXAMINER